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AUTHOR(S):

Nishimuta, Yuji

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GERMAN CAPITALISM AND THE POSITION OF AUTOMOBILE INDUSTRY BETWEEN THE TWO WORLD WARS (1)

by Yuji NISHIMUTA*

Introduction—*Analytical Standpoint and Problem Identification*

The First World War ended with the capitulation of Germany. It was by no means a simple defeat for the country, because the hardship four and a half years of warfare was unprecedented in the history. It was a total war accompanied by tremendous sacrifice on both sides. Establishment of Soviet Russia in the previous year strongly influenced Germans, and on October 29, 1918, the revolt of Marine Corps at Kiel Naval Base propagated itself like a wild fire to all over the country. The revolution led to a general strike in Berlin on November 9, and then on the following day to the "Arbeiter und-Soldatenräte" (the Council of Workers and Soldiers) which constituted the Revolutionary Goveonment.

The revolution, accompanied with fierce civil war in surrection, was avorted by the adoption of "capital-labor entente" of Social Democratic Party which was based on the so-called "zentralarbeitsgemeinschaft" of November 15 concluded between K. Regin; Chairman of Freie Gewerkschaften (affiliated with Social Democratic Party) and the leaders of Gergan monopoly capital, W. Ratenau, C. F. v. Siemens, F. Stinness and others. In August, 1919, the "Weimar Structure" was born. In the meantime, the "hyperinflation" started in 1921 reached the peak two years later, and finally in 1924, the intervention of the United States in the reparation issue —"the Dawes Plan" triggered a large inflow of credit from America. Mark became stable again, and it paved the way for resurrection of German capitalism.

We must not, however, overlook the fact that behind the economic crisis resulting from the capitulation of Germany and ensuing political confusion, there was an even more fundamental crisis surrounding German capitalis on itself. The crisis had many different aspects and it is not esay to reduce them into a simple description, but the author considers that it can be summarized in three key points.

First point: if we direct our attention to constitution of leaders of the German revolution (Räte movent), we notice that the nucleus consisted of so-called "Revotionäre Obleunte"-group of intra-company activists, and in particular those skilled workers who were members of

* Associate Professor, Faculty of Economics, Kyoto University.

Deutsche Metalarbeiter Verband (German Metalworkers Union).[1] As will be explained later, they are characterized by a certain managerial role in the diverse process of machining and assembly work. The fact that these privileged workers formed the nucleus of Räte signifies that the "dictatorial leadership to labor",[2] as the fundamental norm of capitalism in production process, started to lose the ground within one of the bases of German capitalism. This intrinsic crisis did not disappear even after the danger of outright revolution had been overcome. The advent of Weimar structure added further constraints to the capitalists such as recognition of labor union's "equal status" and eight hours' labor pere day. In these circumstances, was the capital able to reassert the "dictatorial leadership on labor", and if so, by what ways and means? Thus is the first point.

Second Point: the defeat, loss of all colonies under the Verssailles Treaty, session of Alsas Lorraine and a part of Schlesian and huge reparation payments–all of these had an effect to weaken German capitalism. Inflation temporarily benefited export, but it also caused delay in replacement of obsolete capital equipment. Thus, as soon as the mark became stable as a result of the Douse plan and German capitalism was reintegrated into the normal structure of international market, German industry came to be exposed to overwhelming competitive strength of American industry which had gained strength before, during and after the First World War. Inferiority of German industry was such that certain sectors seemed to have little chance of survival. In this context, the lack of competing strength in the international market becomes the second point of criteria.

Third Point: It relates to the crisis of imperialistic existence of German capitalism resulting

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1) Tsubogou Minoru: "Keiei Räte Undono Kiso–Daiichiji Sekai Taisento Taishunai Katsudokasono Keisei (The Bases of Management Räte Movement–The First World War and Formation of Activists among the People)" (1)～(4) in "Hogaku Zasshi", Osaka Municipal University, Vol. 24, No. 1, 2, 4 and Vol. 25, No. 1. Also, see P. v. Oertzen, "Betriebsräte in der November Revolution", Düsseldorf, 1963, p. 371.

2) "In the production process, the capital assumed *the right of command over the labor, that is to say, on the acting workforce or on workers themselves*". "The capitalistic command is characterized by a dual structure, because on one hand, the production process under its command is in itself a social process of work to produce goods, while on the other hand it is also a process in which the capital multiplies its value. The command takes a despotic form". K. Marx, "The Capital", Hoyaku Zenshu, Vol. 1, Ia p. 407 and 435 (the author's underline).

As to the "despotic command over the labor" exerted by the capital according to Marx, this concept is used as a key to analysis of capitalism by Ozaki, Shuji in his "Shihonshugi kara Shakaishugi e — "Hiteino Hitei Mondai ni Yosete" (From Capitalism to Socialism) — a study of the "Negation of Negation" Issue, and "Shoyu Henkakuto Kaikyu to shiteno Rodoha — Shihonshugi kara Shakaishugi e (Part II) (Transformation of Ownership and "Workers as a class"— From Capitalism to Socialism) in Keizai, 1975–6, and 1978–5, A study of the history of political econmy based on the same concept was undertaken by Shimizu, Katsuhiro in "Sangyo Kakumeiki France ni okeru Rodosha Hinkon Mondai" (Impoverishment of Workers in France during the Industrial Revolution) in Keizai Ronso, 127–2 • 3 and also by Koda, Ryoichi, in "Doitsu Kikai Kogyo to Löwesha Shin Kojo" (German Machinery Industry and Löwe's New Plant), in Keizai Ronso, 129–6.

in particular from disbanding and loss of the country's military forces. In the course of capitulation to revolution, the German armed forces completely lost its commanding system. The collapse was further aggravated by the ban on armament imposed under the Versailles Treaty. The occupation of Ruler District by France and Belgium of 1923 and the ensuing economic confusion disclosed that the base of German imperialistic capitalism became extremely fragile. Would the German capitalism eventually be able to restore its imperialistic autonomy in competition with other imperialistic powers? This issue is the third point.

The real crisis to be understood in the light of these three issues. Whether or not and how the crisis was to be overceme? The chance of survival of German capitalism following stabilization of mark in 1924 largely depended on this basic issue.

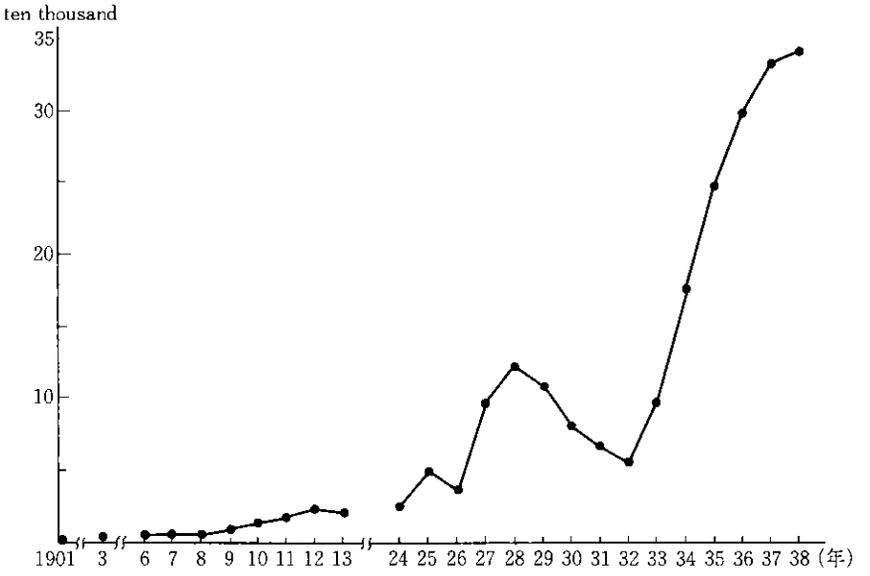
At the risk of oversimplification, perhaps we might make the following statement: an approach to resolve the three crises of German capitalism already referred to first emmerged under the Weimar Structure as the industrial rationalization movement–so–called "der Rationalisierrungsbemegung". This movement, however, not only failed to turn out successful consequences, but served to aggravate contradictions, and another crisis was to emerge in new forms. Finally, and in the global recession, a sort of "answer" appeared under the Nazi Regime.

If we adopt such a point of view to understand the German capitalism between the two World Wars, it would be very appropriate for us to focus our attention to the history of growth of German automobile industry during this period, because it showed a unique pattern of development in this period.

Figure 1 shows automobile output in Germany from the turn of the century until 1938. German automobile production in this period contains two distinct phases of development. The first phase corresponds to the "industrial rationalization movement" from 1924 to 1928. The industry achieved a rapid growth of unforeseen character during this period, completely different from the prewar pattern. In the same period, gross national output and those of major industrial sectors in Germany proceeded as follows (base year 100=1913) : gross output was 71.9 in 1924 and increased to 102.1 in 1929, while output of coal and steel grew from 62.5 to 86.0 in the same period. From 1925 to 1929, electrical equipment and chemical products grew from 146 to 238 and 133 to 186.1, respectively.[3] In comparison, growth of automobile output was disproportionately high – from 120 in 1924 to 738.5 in 1928, although we also notice that the growth peaked out in 1928 and started to decline even before the worldwide panic of October, 1929 and decline of other industry in Germany (index of auto production in 1929 was 686.0). The share of automobile industry in the total industry of Germany, however, was far from

3) Kurihara Masaru: "Nazism Taiseino Seiritsu" (The Establishment of Nazi Regime), 1981, p. 263, Table 28.

The data on automobiles were those extracted from statistics classified as "Automobiles and Marine Vessels". W. G. Hoffman, "Das Wachstum der deutschen Wirtschaft seit der mitte des 19. Jahrhunderts", Berlin/Heideiberg/New York, 1965, p. 342f. For total output and electrical machinery, see J. Kuczynski, "Die Geschichte der lage der Arbeiter unter dem Kapitalismus, Bd. 5, S. 3, 23.



H.C.G. v. Seherr-Thoss, *Die deutsche Automobilindustrie*, 1979, S. 632.

Fig. 1 German Automobil Output 1901—1938.

important.[4] In 1927, "land transportation vehicle" including automobiles was no more than 2% of total industrial output, way below that of coal/steel (15.6%), chemical products (15.0%), electrical equipment (4.8%) and textiles (14.8%).

The second phase covers six years from 1933 to 1938 (Figure 1). We can see that from the very moment of establishment of Nazi Regime, the automobile industry started to grow at a rate far ahead of the growth during the first phase, with a result that the importance of automobile industry in the framework of German capitalism became totally different. Table 1 a shows transition of output by major industry of Germany from 1933 to 1938, and Table 1b indicates movement of export by these industrial sectors in the same period. These tales demonstrate that by the end of 30's, German automobile industry achieved a scale comparable to those traditional key sectors like coal/steel, electrical machinery and chemicals both in output and in volume of export.

In the course of development in these two phases, the German automobile industry was able to grow but of almost negligible status to one of the major factors of German industry. Of even greater importance, the Nazi Regime undertook positive measures at the start of the second phase to promote automobile-related industry, of which construction of Autobahn was a typical

4) Kato Eiichi: "Weimar Taiseino Keizai Kozo" (The Economic Structure of Weimar Republic), 1973, p. 191, Table 34, which was based on the "Statistisches Jahrbuch für das Deutsche Rbich", 1929, p. 344-345.

Tab. 1 a German Main Industries Output 1933–1938 (million RM)

Industry	1933	1934	1935	1936	1937	1938
Coal	1,169	1,304	1,512	1,697	2,047	2,173
Iron	282	463	665	883	891	1,093
Steel	562	826	1,138	1,405	1,553	1,935
Automobil	383	700	1,148	1,414	1,636	2,017
Synthetic fiber	141	210	248	275	437	557
Cotton	303	—	409	446	494	525

b German Main Industries Export 1934—1938 (million RM)

Industry	1934	1935	1936	1937	1938
Coal	224.5	261.4	277.5	440.4	379.5
Cotton	39.2	41.7	52.1	86.1	92.0
Chemistry	169.0	172.0	177.9	195.3	169.4
Machin tool	87.0	78.2	148.2	209.1	206.9
Electrical Equipment	218.6	226.0	258.3	312.3	335.4
Precision Instrument	62.3	72.4	90.5	116.5	120.0
Automobil	94.5	120.0	171.2	269.7	259.4

Statistisches Jahrbuch für das Deutsche Reich, 1935–1940.

R. J. Overy, Cars, Roads, And Economic Recovery in Germany 1932–8, *The Economic History Review 2nd Ser. 28–3*, 1975, P. 479.

example.

What was the significance of the phenomenal growth of automobile industry to the overall German capitalism between the two world wars? Above all, what role did it play in conjunction with solution of the three crises inherent in German capitalism after the First World War? This paper attempts to find the answers to these questions.

In looking over history of economic research, and particularly those previous discussions among Japanese researchers on the subject of German capitalism between the two World Wars,[5)]

5) Some examples of research made in Japan regarding German capitalism between the two world wars are: Tsukamoto Ken, "Nazis Keizai" (Nazi Economy), 1964, Kato Eiichi, "Weimar Taiseino Keizai Kozo" (1973, ibid. (4), Institute of Social Science, Tokyo University, "Nazis Taiseito New Deal" (Nazi Regime and New Deal), 1975, Kurihara Yu, "Nazism Taiseino Seiritsu, 1981, ibid. 3, and Ono Eiji, "Gendal Doitsu Shakaishi Kenkyu Josetsu" (Introduction to the Social History of Modern Germany) 1982. In addition, the following papers should be of interest: Institute of Social Science, ibid., containing "Nazism Taiseikano Tekko Shihon" (Steel Industry Capital under the Nazi Government) by Kudo Akira, "Nazism no Rodo Seisaku" (Nazi Labor Policy) by Tobara Shiro, and "Nazis Zaisei" (The Finance of Nazi Goverment), Kato Eiichi, Ref. also Kudo Akira, "IG Farben no Seiritsuto Tenkai" (Founding and Development of IG Farben), (1), (2), in "Shakai Kagaku Kenkyu", Vol. 29, No. 5 and 6.

we notice that primary attention was given to those traditional industrial sectors dating back to the Second Empire such as coal/steel, electrical machinery and chemicals. Some references to automobile industry do exist, but due to its negligible status during Weimar period, it was largely excluded from the scope of detailed study,[6] and in the author's opinion,[7] this does not seem reasonable, because the absence of interest has acted as a major constraint to discussion on German capitalism during this period.

What is important is not absolute or relative norms applicable to German automobile industry from time to time. The real importance concerns the fact that the status of the industry within the total framework of German capitalism underwent a radical and qualitative change during the period. By concentrating our attention to this phenomenon and from such a point of view during the years from the "rationalization movement" of Weimar period to the advent of Nazi Regime, it might be possible for us to gain a new Insight into the transition of overall German capitalism during the period between the two World Wars, and above all, to the establishment and development of the Nazi Regime itself.

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6) References to German Automobile industry can be seen in Tsukamoto (ibid. p. 246, 296, 313, 314), Kato (ibid., p. 210, 211), Kudo (ibid. "Tekko" p. 108), Tohara (ibid., p. 161) and Kurihara (ibid., p. 261), although they are by no means exhaustive in extent.

As an early example of research on German automobile industry between the two World Wars, see Furukawa, Sumiaki, "Volkswagenwerk no Seiritsu Katei" (Process of Establishment of Volkswagenwerk) (1), (2) in "Rokko-dai Ronshu", 1978, and "Volkswagenwerk no Seisei no Shiteki Zenkeieno Sekkin" (An Approach to the Historical Study of Growth of Volkswagenwerk), (1), "Doitsu Jidosha Kogyono Hattenno Shuyo Tokucho (Main Characteristics of Development of German Autombile Industry), in "Kagoshima Keizai Ronshu, 1982. Although these studies are confined to the history of Volkswagen, they provide accounts of general characteristics of the growth made by German Automobile industry at large. The author, however, holds different views on several factual issues discussed in these papers as mentioned later. Nakamura Seiji, "Gendai Jidosha Kogyoron" (Modern Automobile Industry, 1983, p. 121–124 and Abo, Tetsuo, "Sengoki Americano Taigai Toshi (Overseas Investment by the Pastwar U. S. A.) 1984, p. 229, pp. 235–238, also contain some broad references based on these authors' standpoints.

7) Discussions and theories offered by Japanese researchers on the German capitalism between the two World Wars and in particular those no Nazism may be classified into three thpes: (1) those which are based on "type" concept, i. e., to understand German capitalism as a special type of capitalism and explaining Nazism as the product of "underdeveloped" and "archaic" characters of capitalism in Germany, (2) theories based on the national monopolistic capitalism, and (3) theories based on "intermediate class" concept. The author plans to develop his research in this area some time in future.

I "Industrial Rationalization Movement" and Transformation of Production-process in the German Automobile Industry

G. Schlesinger,[8] Professor of Mechanical Engineering at the Berlin Technical University, often called "the Father of Industrial Rationalization Movement[9]", made an important comment in 1925. He said; "the opening of German frontier may mean the death of our automobile and automobile-related industry, and if that happens, we will never see them again".

The statement contained in a pamphlet[10] titled "Der Daseinskampf der Deutschen Automobilindustrie" (The Struggle for survival of German Automobile Industry) presents a circumstance clearly portrayed in the figures of automobile import/export in Germany when the mark became stable (Figure 2). We can see that export tumbled while import event up sharply. This happened because competitive strength of automobile industry in Germany fell far behind of others, especially that of the United States. Table 2 shows price comparison prepared by Reichsverhand der Automobilindustrie (German Automobile Industry Association) in 1925 as a data in support of its demand for protective tariff on German and U. S. cars of comparable classes. For every class of cars, duty free cost of U. S. made car is less than a half of German car. A Ford car cost only 40% of Brennabor which belonged to the equivalent class. This surprising productivity gap between the German and U. S. automobile industry is even more clear if we compare number of workers needed to producer a car.[11] In Germany, one Arger Took 120 workers, a Horch 350, and a Benz 450. Against this, in the United States, a Ford took no more than 5-3/4 workers to be completed.

These data are sufficient to convince us that the tremendous productivity gap between the U. S. and German automobile industries arose not from quantitative (scale) factors but from fundamental qualitative difference in the structure of production (technical process and organization of workforce).

In response to the desperate plea of Reichsverband der Automobilindustrie, "Erziehungszoll" (a protective duty characterized by degressive tariff) was introduced, and this allowed the German automobile industry to improve rationalization of production. We are going to see,

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8) For the Industrial rationlization movement in Germany, see Yoshida Kazuo, "Doitsu Gorika Undo Ron" (Rationalization in Germany), 1976, Tsukamoto and Kato, ibid. Examples of study published before the Second World War are Arisawa Hiromi and Abe Isamu, "Sekai Kyokoto Kokusai Seijino kiki" (Worldwide Recession and Crisis of International Politics), 1931 and Seiichi Kojima, "Sangyo Gorika" (Industrial Rationalization), 1930. However, as stated by Abe, (ibid., p. 170), there is no consensus among these authors regarding the results and limitation of the movement.

9) Koda, ibid., and "Doitsu Kikai Kogyoshi • Gorikaundoshi to G. Schlessinger no 'Keiei Kagaku' (History of German Industry and Rationalization Movement, and the 'management Science' of G. Schlessinger, Saga Daigaku Keizai Ronshu, 16-3, 1983.

10) Berlin, 1925, Zitiert bei F. Ledermann *Fehlrationalisierung—der Irrweg der deutschen Automobilindustrie seit der Stabilisierung der Mark, Betribswirtschaftliche Studie eines Bcispieis der Investionskonjunktur,* Stuttgart, 1933, S. 15.

11) E. Honermeier, *Die Ford Motor Company,* 1926, Leipzig, S. 127.

Scherr-Thoss, *a. a. O.*, S. 216.

Fig. 2 German Automobil Import and Export 1922—1926.

Tab. 2 Prices of American Car and German Car 1925

American Cars	Its weight	Its Price without tariff	German car of comparable class	Its price
	(Kg)	(RM)		(RM)
Ford	720	2,430	Brennabor	6,050
Chivolet	810	2,849	Dixi	8,075
Buick	1,565	6,452	Protos	13,500
Cadellack	1,980	16,650	Audi 18/70	30,500

Almut Addicks, *Die deutsche Kraftfahrzeugindustrie in Nachkriegszeit (Seit 1924)*, Diss. München 1933, S. 26.

under these circumstances, how the industry carried out its struggle for survival—"der Daseinskampf".

2. From "Reihenfertigung" to "Fliessferfigung"

At the time when German automobile industry faced the overwhelming superiority of the U. S. competitors, the industry was based on a production system which was called "Reihenfertigung", consisting of a lot of 100 to 500 cars.

> "First, size of a production lot is determined, materials needed for the lot are ordered, and production starts when the materials ordered have been delivered. Normally, one production cycle (series) takes a quarter of year, which means that in total, three

quarters of a year go from ordering of materials to delivery, stocking, repetition of machining and intermediary stocking to final assembly. All capital is thus locked up in the cycle, and a new series starts only when all investment has been recovered.[12]"

In order to improve the out dated production system which was clearly uncompetitive, German automobile industrialists and engineers started massive pilgrimage (Pilgerfahrt)[13] to the United States. Their holy land was Highland Park in Detroit.[14]

Adam Opel in Rüsselsheim-am-Main was the first to introduce "Fliessband" (belt conveyor) in 1923. Following this, belt conveyor systems were installed successively by Brennabor-Werke (Brandenburg) in 1924, by Adler-Werke (Frankfurt A/M) and BMW Bayerische Motorenwerkerke (Munich) in 1926, and by Daimler-Benz (Stuttgart) in 1927 according to company records.[15),16] A survey[17] conducted by the German Federation of Metalworkers (DMV), who was to be the party most affected by the productive innovation, tells us that in 1928, of total 29 plants surveyed by the Federation, 18 (or 62% employing 30, 902 workers or 67.9% of total) had experienced complete renovation of production facilities. Four (or 13.8%, with 12,119 or 26.7% of workers) reported implementation of partial renovation, while seven (24.4% with 2,467 workers of 5.4% of total workforce) remained unchanged. This shows that by 1928, the majority of automobile manufacturers in Germany realized "certain" innovation of production. This being the case, we must see how it changed the automobile plants in Germany.

A paper[18] written by Guido Prachtl, an engineer working for Adler-Werke, with regard to the innovation introduced in his own factory, provides us with some insight on the matter.[19] Figures 3A illustrates the Reihenfertigung-based work organization prior to innovation, while 3B shows that of Fliessfertigung.

In the parts machining process of Reihenfertigung (Fig. 3A, lower right side), shops

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12) P. Friedman, *a. a. O.* S. 61.

13) A. Becker, *Absatzproblem der deutschen PKW—Industrie* 1925-1932, Diss. Regensburg, 1979, S. 68ff. P. Riebensam, *Der Zug nach USA, Gedanken nach einer Amerika-Reise,* Berlin 1924.

14) Regarding "Ford System", see Mori Shigetaka, "Keiei Kanri Soron" (Management), 2nd (Revised) edition, 1965, and Shiomi Haruhito, "Gendai Tairyo Seisan Taiseiron" (Modern Mass Production), 1978.

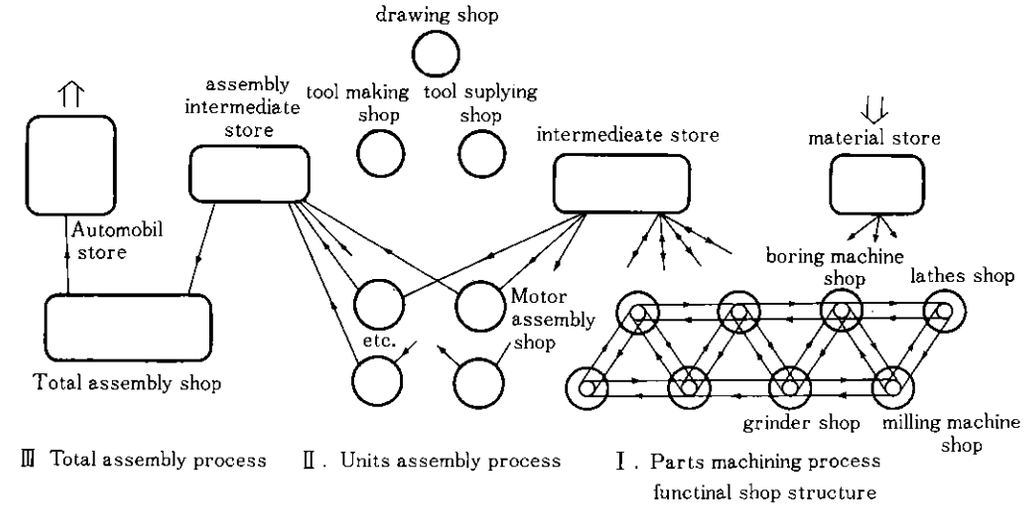
15) Daimler=Benz AG, *75 Jahre Motorisierung des Verkehrs,* Stuttgart-Untertürkheim, 1961, S. 225. H. Maurer, *Das Zusammenschlußproblem in der deutschen Automobilindustrie mit besonderer Berücksichtigung der Auto-Union AG,* Diss. Zürich, 1936.

16) G. Schlessinger wrote in the "Werksstattstechnik" a periodical under his editorship, on this process —see Zeitgemässebetriebsorganisation in einer deutschen Automobilfabrik, XXJg. 15, 10, 1926, Heft 20. This account is followed by pictorial reports from each automobile plant.

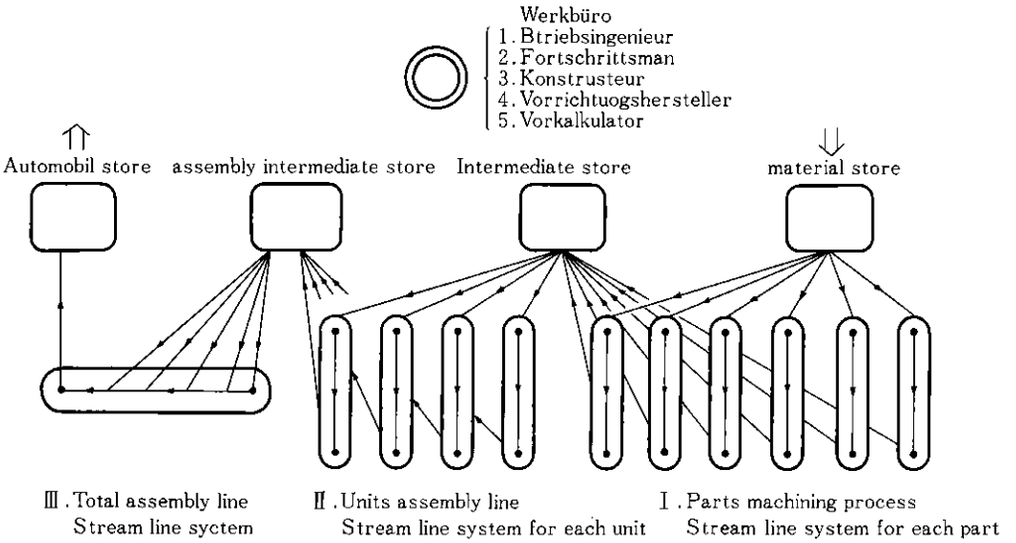
17) Der deutsche Metalarbeiterverband, *Die deutsche Automobilindustrie Anfang 1928,* zitiert bei F. Lederman, *a. a. O.* S. 27.

18) G. Prachtl, *Von der Reihenfertigung zur Fließarbeit insbesondere mi deutschen Automobilbau,* Diss. Technischen Hochschule Darmstadt. 1926.

19) F. Schumann, Die Arbeiter der Daimler = Motoren = Gesellschaft Stuttgart = Untertürkheim, "Schriften des Vereins für Sozialpolitik", 135 Band L, Leipzig, 1911, was used as reference to complement data on workers at Reihenfertigung.



A Workig Organization of "Reihenfertigung"



G. Prachtl, *Von der Reihenfertigung zur Fließarbeit*, 1926, S. 7.

B Working Organization of "Fließfertigung"

Fig. 3

are divided into specific types of machine tools (lathes, boring machines, milling machines, etc.) with specialized operators for each type of machines. Generally speaking, each shop has the head (Meister), skilled workers (Professionist), semi-skilled workers (Angelernte), unskilled workers (Ungelernte) and apprentices (Lehrlinge). The company subcontracts (Akkord) with the Meister or Professionist who then leads semi-skilled and lower levels of workers to complete the job, often by organizing people into "Kolonen", each comprising several workers. The Meister and Professionist are solely responsible for production management including work planning and methods. They were skilled enough to organize work around the machines in their charge, and for this reason, they were highly independent in command of both mental and physical aspects of the work. Training of skills of workers was also their responsibility. Thus, since each shop is functionally independent, materials to be processed must be moved by movers back and forth among these shops. Assembling of a car required a number of fine adjustments by "Kolonen" of workers led by a skilled worker (Professionist). As such, in the Reihenfertigung type of organization, the entire work process is entrusted in the hands of the Meister and Professionist as individuals.[20]

On the other hand, novelty of the Fliessfertigung is blatantly clear (Fig. 3B). Those functional shops of specific types of machine tools now disappear, and instead, we see streamlined flows of production for each types of parts and components. These flows then go on to streamlined assembly lines of engines, gear boxes and other units, and then to the final complete assembly lines. From the point of entry of raw materials to the departure of completed vehicles, the work flows like a stream. Machining and assembling are now a part of the downstream, in which Fliessband (belt conveyors) acts as the dominant factor of forced progression (Fliess means stream).

As the result of the drastic change of production process, function of individual workers and "social organization of labor" undergo a complete transition. Each worker, now posted along continuous stream of production line, repeats a same, and highly fragmented, work over and over again. Conventional skills are no longer required. The "mental factors of work process" are now completely detached from workers and become "objectified" in mechanical systems. Management of the entire plant operations is now concentrated to "Werkbüro" (Production Control Room), shown in the middle of Figure 3B together with its functional breakdown, where engineers and managers supervise the plant.

This "remodelling of production process" by the application of "American Model"[21] eliminated completely the relative independence of workers under the Reihenfertigung organization based on individual skill. The capital now acquired a direct, material and objective means to

20) So called "organized sabotage" which occurred often at metallurgy • related plants in major capitalistic comity from the end of 190 to the beginning of this century was partly due to this factor. In the postwar Germany, it became the basis for workers Räte movement as explained already.

21) The term "U. S. Model" (American System) is used here not in its narrow reuse of so-called "American system of manufacturing" which started to be used following the World Industrial Exposition of London in 1851. Rather, it means the "U. S. production system in the 20th century" as it is seen in the advent of Ford system in the first decade of this century.

Tab. 3 German Automobil Output and its workers index 1925=100, 1925—1928

year	1925	1926	1927	1928
workers	100	64.0	91.4	101.0
output	100	91.9	232.4	279.2

Hermann Maurer, *Das Zusammenschlußproblem in der deutschen Automobilindustrie*, 1936, S. 14.

establish a "dictatorial hegemony" over workers.

In this process, workers skilled in machining and assembly—the group of people which produced a number of revolutionary leaders (so-called "Obleute") at the time of Arbeiter-und-Soldateuräte— were completely dispelled from direct lines of production insofar as the German automobile industry was concerned.[22] Table 3 illustrates transition of the industry's output from 1928 in relation to fluctuation of number of workers employed. It clearly tells us that the German automobile industry in this process expelled a large number of workers out of production lines (see 1926) while expanding rapidly its capacity. This occurred along with formation of an element of the "new intermediary class", or those employees having technical educational background who are distinctly different from line workers.

II Management Crisis of German Automobile Companies and Factors of the Crisis

1. Management Crisis

We have seen that the German automobile industry achieved a radical transition of production process under the "industrial rationalization movement". A further look into the industry, however, brings us a surprise. In spite of the tremendous production capacity, the industry was affected with a serious management difficulty.

Table 4a shows the transition of dividend rates declared by the major automobile manufacturers in Germany from 1913 (before the start of the First World War) to the period of "industrial rationalization movement".[23] In the year 1913 immediately preceding the war, 14 out of 18 companies were paying dividends, and of these 14, 9 maintained the dividend rate to 12% or more. During the rationalization period, the situation changes radically. From 1923 to 1924, only 9 or one third of 27 companies were able to declare dividend payment. The number of companies paring dividends decrease from year to year thereafter −6 in 1925/26, 9 in 1927/28,

22) In considering those approaches taken under the "industrial rationalization movement" (ref. Yoshida, ibid., p. 94) as well as their overall characteristics, we may presume that the same process took place in other sectors of industry as well. For the purpose of the present study, we need not consider this aspect.

23) F. Ledermann, a. a. O., S. 13. Adam Opel and Brennavor are not included because they were private (family) companies at that time.

Tab. 4 a Dividend rates of major German Automobil firms (%)

year / firm	1913 \14	1923 \24	1924 \25	1925 \26	1926 \27	1927 \28	1928 \29	1929 \30
NAG	0	12	6	6	0	0	0	0
Presto	0	12	12	8	6	—	—	—
Dux	—	0	0	0	—	—	—	—
Büssing	—	8	5	6	5	5	0	0
M-Mulag	15	0	6	0	0	—	—	—
Dürkopp	16	0	0	0	0	0	0	0
Hanomag	20	0	0	0	0	0	0	0
R. Ley	5	0	0	0	0	4	0	0
Hansa-Lloyd	5	8	0	0	4	0	0	0
"Hansa"	—	0	0	0	0	0	—	—
Horch	15	0	0	0	8	8	0	0
Adler	17	0	0	0	5	0	0	0
Magirus	12	6	0	0	0	0	0	0
Benz	0	0	0	—	—	—	—	—
Daimler-B.	14	0	0	0	0	0	0	0
Gothaer-W	12	0	0	0	0	0	0	0
Cyklon	—	0	10	—	—	—	—	—
BMW	—	10	10	12	14	14	7	0
Vomag	30	0	0	0	4	6	8	0
Elite-Diamont	0	0	0	0	8	0	0	0
Wanderer	24	12	12	12	12	6	0	0
Daag	9	0	0	0	0	0	0	0
Stoewer	—	10	0	0	0	6	0	0
DKW	—	0	0	0	0	10	0	0
Audi	—	5	0	0	0	0	0	0
Phönomen	—	0	10	6	6	6	6	6
Herkules	4	0	8	0	0	0	0	0

b Their net losses (RM)

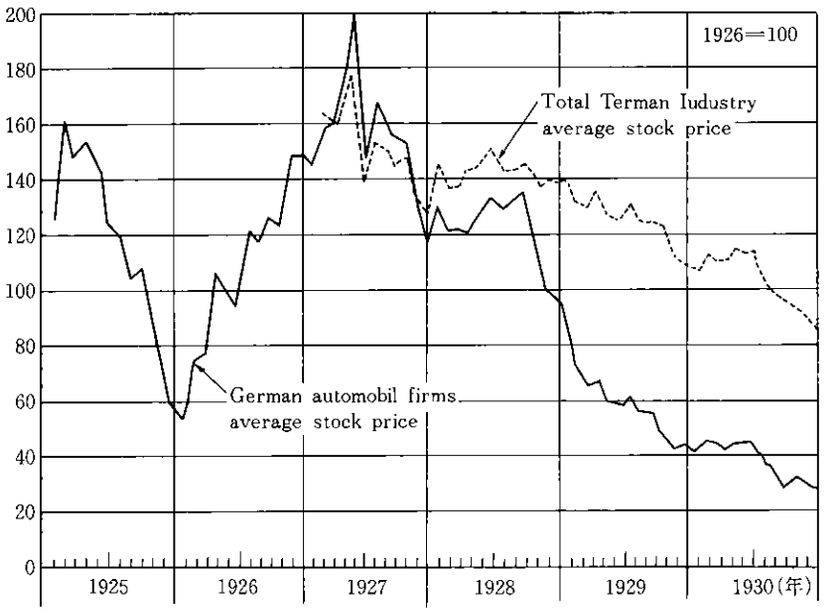
1913 \14	1924 \25	1925 \26	1926 \27	1927 \28	1928 \29	1929 \30
0	0	0	0	5,408,494	14,022,952	0
0	0	0	0			
	12,693	0				
	0	0	0	0	0	608,075
0	9,174,392	0	226,944			
0	0	0	0	306,752	495,687	3,221,071
0	0	0	0	5,096,622	697,643	3,735,234
0	1,996,023	0	0	0	0	0
0	0	2,160,179		0	0	0
	0	2,465,635	0	378,776		
0	0	0	0	0	0	4,925,000
0	0	0	0	2,006,114	0	0
0	0	0	4,945	1,241,664	889,132	1,179,036
0	0					
0	0	0	0	0	0	7,477,496
0	0	4,428,031	891,703	9,082,984	0	0
	0					
	0	0	0	0	0	0
0	0	0	0	0	0	201,566
0	0	493,116	0	442,002	4,911,601	0
0	0	0	0	0	1,631,034	0
0	660,800	0	1,252	57,384	1,478,505	2,963,992
	2,077,735	0	0	0	0	634,382
	0	0	0	0	0	1,731,897
	2,895,913	2,505,912	0	136,917	65,629	594,209
	0	0	0	0	0	0
0	0	0	0	0	0	0
計 0	16,817,556	12,052,873	1,124,834	24,157,709	24,192,183	27,271,953

F. Lederman, *a. a. O.*, S. 31.

and then down to 3 in 1928/29, while all the rest simply omitted all dividends. BMW, Wanderer and Vomag were the rare exceptions, but their profit came from other sources: in the case of BMW, motorcycle and aircraft engine, typewriters and business-use calculator for Wandere, and in the case of Vomag, tricotting and roll printing machinery department contributed to their superior performance.[24] In all of these companies, automobile division operated in deficit.

Table 4b shows net losses which appeared in the balance sheets of these same companies. We see that before the First World War, none of them recorded any loss, but during the period period of "industrial rationalization movement", all except BMW turned out large amount of accumulated losses. As of 1929, total of accumulated losses of these 27 companies amounted to 93, 102, 322 RM, which was roughly one-half of their total equity capital of approximately 200, 000,000 RM.[25] Clearly, in spite of the remarkable growth of production output, the German automobile industry at that time was far from successful from a financial point of view, as almost all suffered from serious losses.

Figure 4, based on stock market section of the Frnakfurter Zeitung, illustrates fluctuations



F. Lederman, *a. a. O.*, S. 31

Fig. 4 Index of stock price of German automobil firms 1. 1925—12. 1930 Frankfurter Zeitung.

24) F. ledermann, a. a. O., S. 31.
25) F. Ledermann, a. a. O., S. 34.

of stock price of the German automobile manufacturers in this period. It shows beyond any doubt the dichromatic conditions of these companies. From 1926 to 1927, the "rationalization" movement was popular enough to cause the share prices to skyrocket by 145 points from 55 to 200. However, a crash starts in mid-1927. From the peak of 200 in May, 1927, the stock price tumbles 81 points to 119 in December, and following a period of temporary stabilization, it again starts to fall rapidly. From 132 in August, 1928 to 41 in October, 1929, the stock price lost 159 points. In fact, the German automobile industry had long been in the deep recession[26] prior to the crash of New York Stock Exchange (the black Thursday) on October 24, 1929 which triggered the worldwide panic. Why then was the industry in such a bad status?

2. Direct Reasons

Looking into the reasons why automobile manufacturers of Germany were turning out poor performance, we soon find a significant fact. As we have already seen, 1928 was the year in which these companies managed to increase output by leaps and bounds thanks to the production innovation under the rationalization movement. Automobile output reached the peak. Table 5 concerns this peak year, and shows plant capacity utilization rate for those major manufacturers by comparing actual number of car output and annual production capacity of each company. Understandably, there are considerable differences among them and it is not easy to generalize, but on the whole, we notice that the capacity utilization was quite low. We might ignore the case of Daimler-Benz because it produced only high-class cars, but even the highest of them, BMW and Opel, shows the ratio of no more than 60%, while the averge of the largest seven companies representing 75% of total German car output is a mere 35.4%. This is a sharp contrast to the performance of U. S. car manufacturers in the same year, also included in the table (lower columns). Uhe U. S. automobile makers realized the average utilizazion ratio of 82.0%, while Ford, the best of them, attained almost 90% in plant utilization.[27] This shocklingly low utilization of plant capacity obviously caused drastic impacts on management of the automobile manufacturers in Germany.

It goes without saying that "production rationalization" in the German automobile industry was achieved by huge investment in fixed assets. Because of the special character of the process of values transferred from fixed capital to output, of which we are all aware, magnitude of that part of value of fixed capital transferred to individual unit of output varies to a large extent depending on utilization of plant which represents the most of the fixed invested capital. Fluctuation of plant capacity utilization ratio is thus reflected in cost of output. The larger the amount of fixed capital, the cost variance is greater.

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26) Furukawa, in his "Shiteki Zentei" (ibid.) says that the management crisis of German automobile companies became "apparent" under the Worldwide recession, but it is not correct.

27) The data are from F. Ledermann, a. a. O., 104. based on the Berliner Tagblatt of May 30, 1928. It should be remembered that from 1927 to 1928, Ford was in the process of shifting from Model T to Model A, and for this reason, more research is needed for reconciliation of the data and time factors.

Tab. 5 Plant capacity utilization rate of German Automobil firms 1928

Firm	Plant capacity of a day	Plant capacity of year	Actual output	Utilization rate
Opel	250	75,000	45,543	67.7(%)
Brennabor	250	75,000	6,781	9.0
Adler		24,000	7,233	30.1
BMW		15,000	9,000	60.0
Daimler–Benz		16,000[2)]	11,656	70.3
Auto Union		30,000[2)]	8,655	28.8
Hanomag		26,000	3,400	13.0
Those 7 Firms		261,000	92,268	35.4
German Automobil industry's Total			122,661	

Plant capacity utilization rate of U. S. automobil firms 1928

Firm	Plant copacity of a year	Actual output 1928	Utilization rate
GM	3,375,000	2,700,000	80.0(%)
Ford	2,650,000	2,370,000	89.3
Chrysler–Dodge	932,000	746,000	80.0
Those 3 Firms		5,816,000	
U. S. automobil industry's Total	9,393,000	7,764,000	82.0

1) Ledermann, *a. a. O.*, S. 120.
2) H. Maurer, *a. a. O.*, S. 3.
3) Aggregate of production of Wanderer, DKW, Horch, & Audi.
4) Ledermann, *a. a. O.*, S. 104. Ford includes Ford Canada.

As an example, we will see the case of painting cost at Adler–Werke shown in Table 6. This company replaced manual painting with a new process called high temperature immersion process (Tauchlakierverfahren) incorporated in the streamlined production system. Labor cost, consumption of immersion lipuid and paint vary roughly in accordance with operating ratio. On the other hand, depreciation (value transferred from fixed capital to product) and interest are fixed costs, and for this reason, painting cost per automobile varies depending on the number of automobiles to which the fixed cost is allocated. At the utilization rate of 33-1/3%, the allocation covers 5,000 cars, and painting cost per car amounts to 34.46 RM. When utilization rate is doubled, there are 10,000 cars to absorb the fixed cost, and painting cost per unit drops to 19.64 RM. If full capacity utilization is achieved by producing 15,000 cars, painting cost per unit further decreases to 14.70 RM. If, in this instance, the market determines painting price per unit to be 29.00 RM on the average, then Adler–Werke must incur a loss of 15.46 RM per

Tab. 6 Paiting cost at Adler Werke (RM)

Capacity utilization rate	33⅓%	66⅔%	100
Output a year	5,000	10,000	15,000
Fixed cost depreciation and interest	104,880	104,880	104,880
Labor cost	12,960	15,120	17,280
Consumption of immersion liquid	600	1,050	1,500
Consumption of paint	15,000	30,000	45,000
etc.	38,800	45,360	51,840
Total	172,370	196,410	220,500
Unit painting cost	34.46	19.64	14.70

H. Ludwing, Die Arbeitslosigkeit in der deutschen Automobilindustrie, *Schriften des Vereins für Sozialpolitik*, 185/II, 1932, S. 143.

unit at the capacity utilization rate of 33–1/3% and "annual loss ratio" to total sales of 45%. If utilization is improved to 66–2/3%, it turns out the profit of 0.64 RM per unit or total 6400 RM, which makes annual return on sales of 3.3%. At 100% capacity utilization ratio, the profit per unit goes up to 4.30 RM, turning out total profit of 64,500 RM or annual return on sales of 29.3%. In this case, the "break-even point" is achieved at the utilization ratio of approximately 66% from industrial accounting point of view.

If we extrapolate this example to assume that the same applies more or less to the whole automobile industry of Germany at that time, significance of the extremely low capacity utilization of 35.49% on the average becomes all clear. The outstanding production capacity achieved by massive investment in fixed capital during the "rationalization movement" period could only be justified as a means of cost saving resulting from "mass production"[28]–otherwise it is no more than a "far too expensive" investment.

To see the state of art stream lined production system introduced as a means of "rationalization" consuming raw materials and turning out expensive products which are only to become inventory[29] must have been one of the most irrational sights under the prevailing industrial rationlization movement in Germany. On one hand, the low level of capacity utilization pushed up cost of German cars, while on the other hand import of cheap U.S. cars

28) The concept of "mass production" is obviously a relative one and it is not easy to define it. In this paper, we use it in the sense of an "intrinsic mechanical system" or "autonomous machine system" as distinct from the use of "individual machines which are independent one from the other" (K. Marx, the Capital", Vol. 1, Hoyaku Zenshu Ia pp. 495–497) when such system is continuously operated.

29) F. Ledermann, a. a. O., S. 38.

continued to increase from 12,000 in 1927 to 18,000 in 1928. Furthermore, the number of automobiles assembled by non-German companies established in Germany (U. S. firms mainly) went up from 22,000 in 1927 to 35,000 in 1928.[30] This dual hardship in competition further depressed market price of automobiles in Germany-from 100 in 1925 to 80 in June, 1926, to 70 a year later, and down to 65 in June, 1928.[31] The German automobile manufacturers were caught between the declining price of their products and higher costs to produce them. This was the direct cause of crisis of the industry.

3. Consequences of the Crisis

Table 7a indicates transition of the number of German automobile manufacturers from 1924 (at the start of the rationalization movement) to 1932. The process of rationalization in German automobile industry was at the same time that of elimination of smaller and weaker manufacturers who were unable to invest for rationalization. In fact, the number of manufacturers decreased consistently from 86 in 1924 to 49 in 1925 and to 30 in 1926, but it is of special interest that the elimination process continued even after innovation of production system : the number goes down from 30 in 1926 to 19 in 1927, and then to 17 in 1929. It is clear that in this

Tab. 7 a Number of German automobil firms 1924—32

Year	1924	1925	1926	1927	1928	1929	1930	1931	1932
Firm	86	49	30	19	27	17	16	19	17

A. Becker, *Absatzprobleme der deutschen PKW-industrie*, 1979, S. 56.

b Mergers in German automobil industry 1926~1932

Year	Old Firm	New Firm
1926 6.	Daimler Motoren Werke, Benz & Cie, AG	Daimler-Benz AG
12.	Gotha Wagon, Cycron	Gotha Wagon
1927	Presto, NAG	NAG
1928	Büssing, Mulak	Büssing
1929	BMW, Gotha Wagon, Cycron, Dixi	BMW
1929	Hansa-lLoyd, Hansa	Hansa-Loyd
1929	GM, Adam Opel	Adam Opel Subzideary
1930	Büssing, NAG	Büssing-NAG
1932	Audi, Horch, Wanderer, DKW	Auto Union

Seherr-Thoss, *a. a. O.*, S. 644-645.

30) Seherr-Jhoss, a. a. O., S. 216, 221.
31) F. Ledermann, a. a. O., S. 15.

process, a massive concentration of capital —by mergers and acquisitions— took place in the industry as the result of the crisis.

Table 7b shows important mergers between German automobile manufacturers since 1926. This has achieved the introduction of division of labor among those companies, having realized plant innovation, in order to decrease variety of competing classes of cars and to increase the scale of production and use of common parts and components.[32]

Major banks in Germany[33] (Deutsche Bank, Diskonto Gesselschaft, Dresner Bank, Danato Bank, etc.) were behind the scene, pushing hard to promote the merger process. It is a well-known fact that during the "industrial rationalization movement", foreign capital–especially U. S. banks–supplied a significant part of both short and long-term loans needed for rationalization. Financing of long-term capital by means of bond issue at overseas market[34] was only possible for steel industry, manufacturer of electrical equipment and other big business, far from the reach of German automobile industry still in the infancy. Because of this constraint, supply of capital needed for rationalization of German automobile companies had to come from large banks in Germany. A part of this was supplied from foreign country–U. S. A. for instance in the form of short-term loans to the German banks who redistributed them to manufacturers concerned. It is not surprising that there developed very strong relationships between the banks and automobile companies, and due to the crisis on the part of the borrowers, their growing liabilities allowed the banks to exert more and more influence[35] on management of the companies. As the result of this process, the banks and major automobile manufacturers developed affiliations as shown in Table 8.[36] These large banks were in turn of course instru-

Tab. 8

Deutsche Bank	Daimler-Benz, BMW
Banat Bank	Adam Opel, Adler Werke
Sächsische Staatsbane	Auto Union

32) H. Maurer, a. a. O.

33) For equity assets, balance of deposit etc. of major German banks in the period, see K. Gossweiler, Grossbanken Industriemonople Sfaat. Öknomie und Politik des sfaatsmonopolistischen Kapitalismus in Deufschland 1914-1932/Japanbse translation by Kawanabe, Kumagaya, and Matsumoto, "Daiginko • Kogyodokusen • Kokka—Weimar-ki Doitsu Kokka Dokusen Shihonshugi Ron, p. 422.

34) Tsukamoto, ibid. pp. 60-61 and Table 25.

35) Example 1. In the case of Horch, Saxony National Bank took 2.5 million RM of the total amount (3 million RM) of capital increase. Example 2. Daimler-Benz conveoted its bank liabilities (4 million RM) into stock and bonds, most of which were acquired by Deutsche Bank. Example 3. For Adler-Werke, the loan syndicate headed by Danato Bank subscribed for 15 million RM worth of new shares, and the proceeds were used by Adler to reduce borrowings. A. Becker, a. a. O., S. 66.

36) A. Becker, a. a. O., S. 68.

mental to progress of concentration of capital in the German automobile industry. Deutsche Bank, who now controlled Daimler–Benz and BMW, went as far as to create "German Automobile Trust" by combining "a number of money–losing automobile makers" with a view to compete with U. S. car industry who was far superior in scale.[37] In line with this strategy, Deutsche Bank in 1929 proposed to Danato Bank merger of Opel and Daimler–Benz. Opel was the biggest German producer of lower class cars while Daimler–Benz was the unchallenged leader of high–class vehicles at that time. In 1928, their combined output represented more than 40 percent of total car production in Germany. Success of the merger would have resulted in formation of the nucleus of automobile industry of Germany. Surprisingly, however, Danato offered Opel to General Motors.[38]

What was hidden behind the event was the desire of American financial capital (especially Morgan capital) to seek various ways and means to control major industry of Germany, including but not limited to supply of funds needed by the industrial rationalization movement following the "Doze Plan" of 1924. In that sense, Danato Bank as well as Dresner Bank were a sort of agent for the U. S. capital.[39] In any event, the crisis of German automobile companies developed into a "struggle between the financial capital of Germany and that of the United States over the control of automobile industry of Germany".

We have already seen that the industry was under the constraint of marginal growth of demand for automobiles. In fact, it prevented successful development of mass production system and this was the basic reason that led the industry into the crisis and the apparent failure to stay in competition for survival in the face of the United States. We must clarify why the demand marginality was so narrow, and what was the course of prospects for resolution of the crisis.

37) K. Gossweiler, a. a. O., Japanese translation, ibid., p. 407. The promotor was G. von Stauss, who later became President of the Board of the Auditors. "he was born in Würtenburg, after a period of training at the Royal Würtenburg Bank, he entered Deutsche bank in 1898 to work as private secretary under the Bank's owner, Georg von Siemens, and after his death (1901), under Arthur von Gwinner who was the successer to von Siemens and a leading figure in the struggle with Rockfeller–Standard Petroleum. In 1906, Stauss was made responsible for petroleumrelated activities of Deutsche Bank and as such, he was one of the most important people supporting expansion of German imperialism in the Balkan countries and Middle East. He went to the United States in 1913 and set up an agreement with the Rockfeller Trust. From 1915, he was a Director of Deutsche Bank, and until the postwar period, he oversaw specially electrical machnery, chemicals, automobile, alrcraft, movies and light industry sectors, which were concentrated in the South, i. e. in Bavaria and Würtenberg", (ibid., p. 34, the author's underline).

38) Ibid., p. 407.

39) Ibid., pp. 329, 370. Gossweiler called them "the American Group which the "Dawes" trend created within the monopolistic bourgeoisy in Germany", ibid., p. 329.